June 27, 1933. C. T. DRAPER 1,915,299

REMOVABLE CLOSURE FOR METALLIC CONTAINERS

Filed Oct. 28, 1930 2 Sheets-Sheet 1

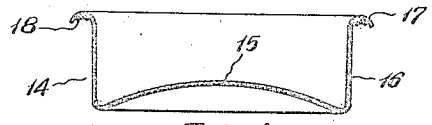


FIG. 1.

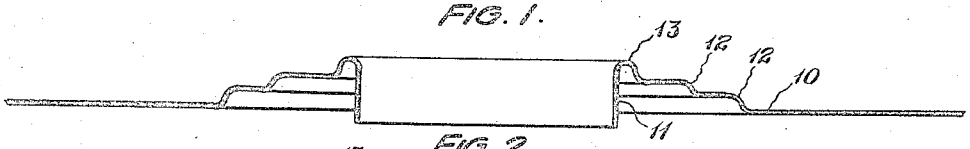


FIG. 2

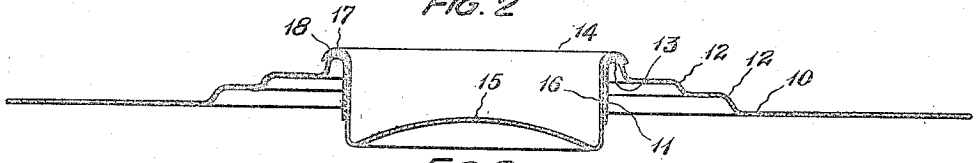


FIG. 3

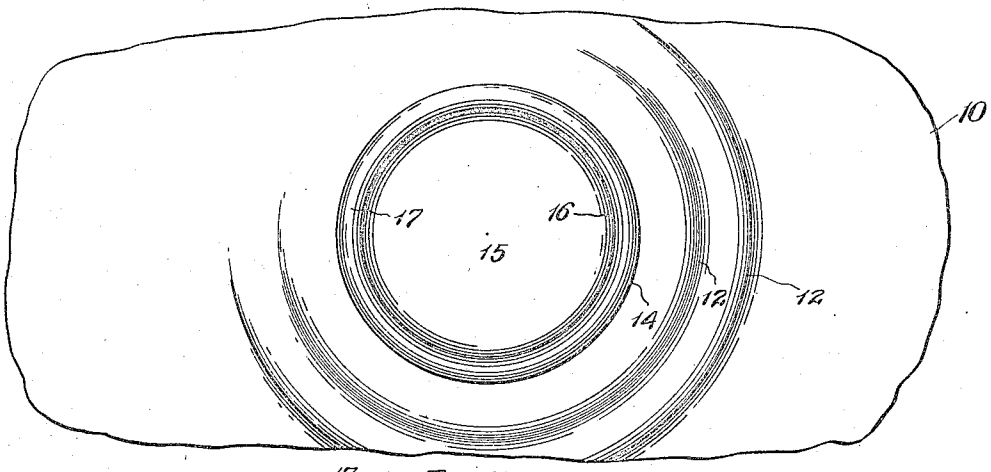


FIG. 5

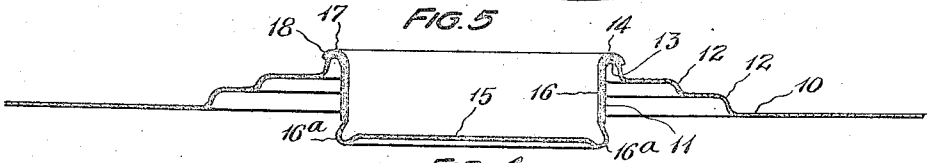


FIG. 4

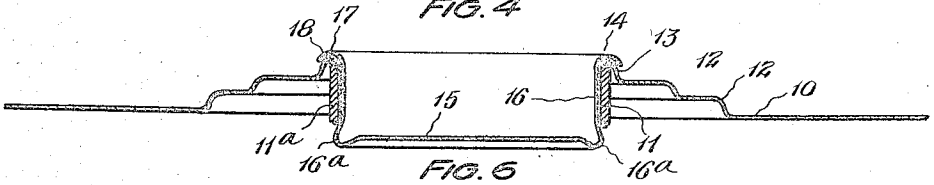


FIG. 6

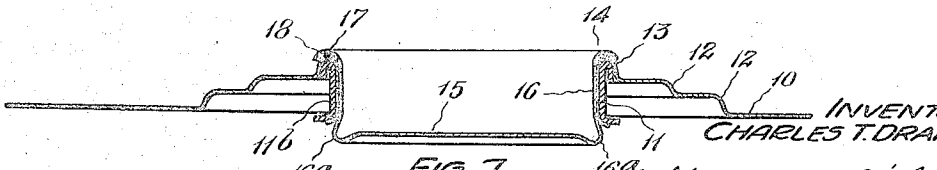


FIG. 7

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June 27, 1933. C. T. DRAPER 1,915,299

REMOVABLE CLOSURE FOR METALLIC CONTAINERS

Filed Oct. 28, 1930 2 Sheets-Sheet 2

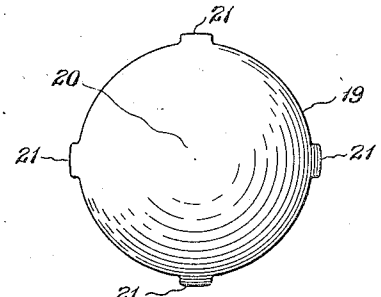


FIG. 8



FIG. 9

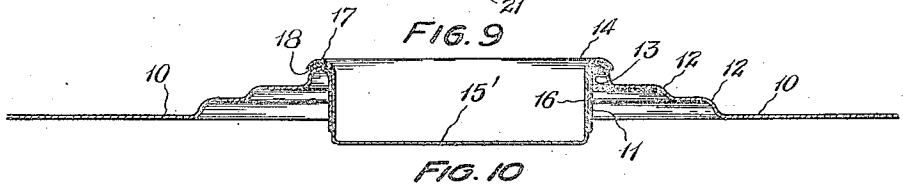


FIG. 10

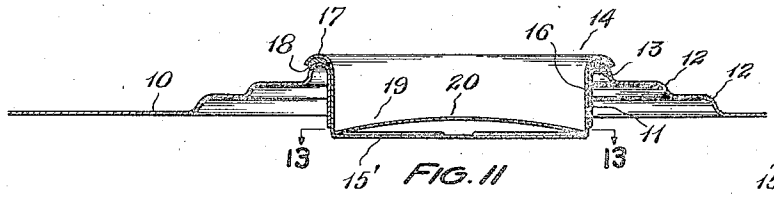


FIG. 11

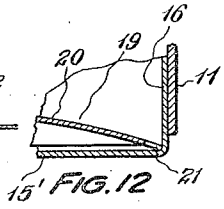


FIG. 12

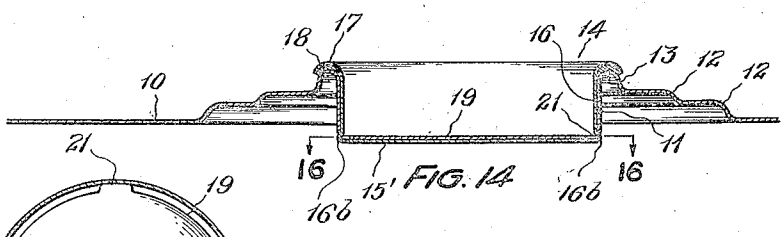


FIG. 14

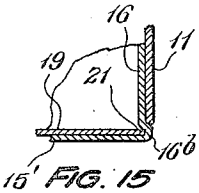


FIG. 15

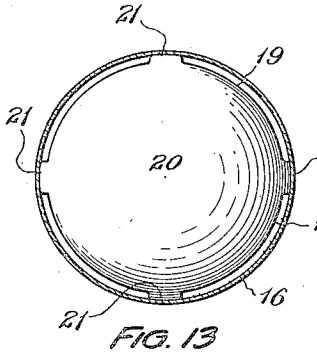


FIG. 13

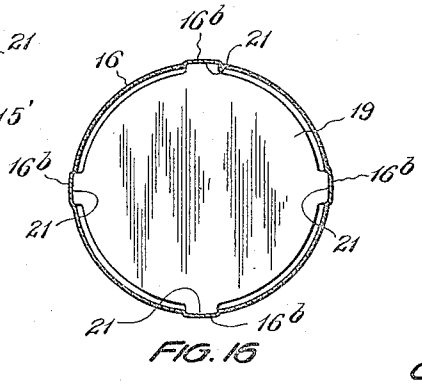


FIG. 16

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Patented June 27, 1933 1,915,299

UNITED STATES PATENT OFFICE

CHARLES T. DRAPER, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO THE DRAPER MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

REMOVABLE CLOSURE FOR METALLIC CONTAINERS

Application filed October 28, 1930. Serial No. 491,689.

The invention relates to closures for metallic barrels, drums, vessels, packages or containers utilized for shipping or storing liquid or semi-solid substances.

The C. T. Draper Patents Nos. 1,381,704, 1,651,342, and 1,667,697, all show removable closure constructions for metallic containers which may be readily and quickly inserted into a container opening and locked in liquid tight sealing relation therewith.

However, each of these constructions require the annular rim of the container wall which forms the container opening to have an annular shoulder and/or an inturned annular lip formed therein. Moreover, each of these constructions requires a plurality of projections and an annular radially offset rim engaging surface to be formed in the cup-shaped closure member.

The provision of these projections, ribs, lips and radially offset surfaces in the rim and closure member of these closure constructions is made for providing means for locking the sheet metal closure member in the container opening.

Although it may be quite inexpensive to form such projections, ribs, lips and radially projecting surfaces on each closure member or container, yet when containers and closure construction therefor are manufactured in large quantities, the cost of forming the closure construction with projections, ribs, lips and the like becomes relatively great.

It is therefore an object of the present invention to provide a sheet metal closure construction for metallic containers which does not require any ribs, projections, lips and the like to be formed in the container wall or closure member for providing locking means for the closure member.

It is a further object of the present invention to provide a closure construction for a metallic container which utilizes the simplest possible type of drawn sheet metal closure member.

It is a further object of the present invention to provide an opening in a container wall with the simplest possible formation of metal at and adjacent the container wall surrounding the opening.

Moreover, it is an object of the present invention to provide a closure construction for metallic containers which will tightly seal the container in a liquid tight manner.

And finally, it is an object of the present invention to provide a removable closure construction for metallic containers which is most simple and inexpensive to manufacture, and which is extremely strong and durable in use.

These objects may be obtained by providing a removable closure construction, preferred embodiments of which are shown in the drawings and hereinafter described in detail, which may be stated in general terms as including in combination with a container having an opening provided with an annular rim directed toward the interior of the container, a cup-shaped sheet metal closure member inserted in the opening provided with dished means for expanding an annular portion of the closure member adjacent its bottom wall for locking the closure member in liquid tight sealing relation in the container opening

Several embodiments of the present improvements are shown in the accompanying drawings, in which:

Figure 1 is a vertical section through one type of improved friction sealing cap or cup-shaped closure member;

Fig. 2 is a vertical section through the simplified container wall opening formation;

Fig. 3 is a vertical section through the container wall with the cap shown in Fig. 1 frictionally engaged within its opening;

Fig. 4 is a view similar to Fig. 3 showing the dished bottom wall of the closure cap depressed for expanding an annular portion of its peripheral wall to seal the cap in the opening of the container wall;

Fig. 5 is a plan view of the construction shown in Fig. 4;

Fig. 6 is a sectional view similar to Fig. 4 showing the improved closure construction applied to a container opening whose depending flange or rim is reinforced;

Fig. 7 is a sectional view similar to Fig. 6 showing another manner in which the de-

pending flange of the container wall may be reinforced;

Fig. 8 is a plan view of a dished disk or welch washer utilized in another embodiment of the improved closure construction;

Fig. 9 is an elevation partly in section of the welch washer shown in Fig. 8;

Fig. 10 is a sectional view through a container wall provided with the improved simplified closure construction after one embodiment of closure cap has been inserted in the opening;

Fig. 11 is a view similar to Fig. 10 showing the welch washer of Figs. 8 and 9 inserted in the closure cap;

Fig. 12 is an enlarged view of a part of the construction shown in Fig. 11;

Fig. 13 is a plan section taken on the line 13—13, Fig. 11;

Fig. 14 is a sectional view showing the improved construction after the dished disk or welch washer has been flattened to lock the cap in the container opening;

Fig. 15 is an enlarged view of a part of the construction shown in Fig. 14; and

Fig. 16 is a plan section taken on the line 16—16, Fig. 14.

Similar numerals refer to similar parts throughout the various figures of the drawings.

The wall 10 of the container may be provided with a tubular rim flange 11 projecting integrally from the wall 10 and preferably directed toward the interior of the container to form an opening in the container wall; and the container wall 10 may be reinforced against distortion at and adjacent the opening by providing the raised annular shoulders 12 and stiffening bead 13 at and adjacent the opening.

The opening is provided with a cup-shaped sheet metal closure member generally indicated at 14 which includes a dished bottom wall 15 in the embodiments of the invention shown in Figs. 1 to 7, inclusive, or a flat bottom wall 15′ in the embodiment of the invention shown in Figs. 8 to 16, inclusive. A tubular side wall 16 extends upwardly from the bottom wall 15 or 15′ and terminates in an outwardly curled rim 17.

In the embodiments of the invention shown in Figs. 1 to 7, inclusive, the cup-shaped member 14 is inserted in the container opening so that the outer surface of its tubular wall 16 frictionally engages the inner surface of the tubular rim flange 11, a liquid sealing gasket 18 being preferably interposed between the bead 13 and curled rim 17, as shown in Fig. 3 of the drawings. When the cup-shaped member is located within the container opening as shown in Fig. 3, the dished bottom wall 15′ thereof is located below the inner end of the tubular flange 11.

A flat end tool is then inserted in the cup-shaped member 14 and the dished bottom wall 15 is depressed axially of the tubular wall 16 to change its location to the position shown in Fig. 4 of the drawings. The depression of or flattening of the dished bottom wall 15 causes an annular portion of the side wall 16 to be expanded or projected outwardly adjacent the bottom wall as shown at 16*a*, which projecting annular portion 16*a* engages the under edge of the annular rim 11 to tightly seal the closure member 14 in liquid tight relation in the container opening.

The embodiments of the invention shown in Figs. 6 and 7 are substantially identical with that shown in Figs. 1 to 5 inclusive, excepting that the tubular rim flange 11 formed in the container wall is reinforced by reinforcing rings 11*a* or 11*b*.

In the embodiment of the invention shown in Figs. 8 to 16, inclusive, a cup-shaped member 14 having a flat bottom wall 15′ is inserted in the container opening so that the outer surface of its tubular wall 16 frictionally engages the inner surface of the tubular rim flange 11, a liquid sealing gasket 18 being preferably interposed between the bead 13 and curled rim 17, as shown in Fig. 10 of the drawings.

The welch washer or dished disk 19 having a dished portion 20 and radial projections 21 protruding from the outer periphery of the disk is then inserted into the cup-shaped member 14 whereupon a flat end tool is inserted to depress the welch washer 19 axially of the tubular wall 16 and flatten its dished portion and change its location to the position shown in Fig. 14 of the drawings.

The depression or flattening of the dished portion of the welch washer causes the radial projections 21 to expand spaced radial projections 16*b* from the annular wall 16 of the cup-shaped member 14 adjacent the bottom wall 15′ thereof, which spaced projections 16*b* engage the under edge of the annular rim 11 to tightly seal the closure member 14 in liquid tight relation in the container opening.

Accordingly, the container is provided with a closure construction utilizing the simplest type of drawn sheet metal closure member and the simplest possible formation of metal at and adjacent the container wall surrounding the opening. Moreover, the improved closure construction tightly seals the container in a liquid tight manner and is extremely simple and inexpensive to manufacture, at the same time being very strong and durable in use.

I claim:

In combination with a metallic container provided with an opening, a cup-shaped closure member inserted in the opening, and a dished disk provided with radial projections protruding from the outer periphery of the disk inserted in the cup-shaped member, the dished disk being flattened to radially ex-

pand spaced portions of the cup-shaped member wall by the protruding radial projections for locking the closure member in liquid tight sealing relation in the container opening.

In testimony that I claim the above, I have hereunto subscribed my name.

CHARLES T. DRAPER.